

Docket No. F-8224

Ser. No. 10/823,919

REMARKS

Claims 3, 5-12, and 21-26 are now pending in this application. Claims 3 and 5-12 are rejected. Claims 1, 2, 4, and 13-20 are previously cancelled. New claims 21-26 are added and are directed to an impregnated battery electrode plate of the present invention.

CLAIM REJECTIONS UNDER 35 U.S.C. §102(b) or §103(a)

Claims 3 and 5-12 are rejected as either anticipated or rendered obvious by the Umiya reference. The applicant herein respectfully traverses these rejections. "Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim* ." *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.* , 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added). For a rejection under 35 U.S.C. §103(a) to be sustained, the differences between the features of the combined references and the present invention must be obvious to one skilled in the art.

The Office Action again states that determination of the patentability of a product-by-process claim turns on the whether the product produced is distinguishable of the prior art product. Applicant does not contest this basic

Docket No. F-8224

Ser. No. 10/823,919

premise of product-by-process claims. However, applicant strongly asserts that Umiya reference does not disclose a product having each and every feature of the product present in the presently pending claims, and further asserts that one following the applied Umiya reference would not be enabled to produce the product of the presently claimed invention.

It is well established that product claims may include process steps to wholly or partially define the claimed product as a product of the recited process steps. See *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972). Each of the independent claims, claims 3, 13, and 21 recite the process steps of the method claims of the parent application which have now issued in U.S. Patent number 6,878,173.

The method of the present differs from the method presented in the Umiya. The method of the Umiya reference impregnates a porous substrate of sponged metal with active substance, presses portions of the substrate to form a protruding rail at areas which are not pressed, brushing is then applied to the substrate to remove the active substance from the protruding rail, and the rail is then pressed down to the level of the first pressed portions. The Umiya reference translation states that "[d]ue to the large hole size of the sponged metal, without press forming, the active substance filled in the sponged metal can fall out very easily

Docket No. F-8224

Ser. No. 10/823,919

.. for example, the active substance can be removed by brushing" Umiya
Translation, Embodiment section.

In contrast to the Umiya teaching, the present invention presents an improved process which can be applied to substrate material containing a binder as is now recited in the claims. The Umiya reference is not directed to an active material impregnation including a binder as recited in the presently pending claims. The substrate in the Umiya reference is not a binder containing substrate. Hence, lacking a binder in the substrate, it is stated that the active material in the Umiya reference "can easily fall out." Umiya, JP 62-136759, translation paragraph "Embodiment."

This is not the case when a binder is used. Brushing is simply not as effective when a binder is present and active material remains in the substrate. While it would be relatively easy to remove an active material from a core substrate by brushing when a binder is not contained, one skilled in the art will recognize that about ten percent of an active material would remain in a core substrate acted on by brushing when a binder is contained. Therefore, although the Umiya reference makes statements asserting that no active material remains, these statements do not carry weight regarding substrates containing a binder.

Increasing brushing to remove material damages the substrate thus weakening it. Still further, brushing is rather inaccurate and also affects areas

Docket No. F-8224

Ser. No. 10/823,919

adjacent to the protruding portion. This action on adjacent areas results in the boundary produced between the exposed areas where the active substance is removed and the remaining impregnated areas being uneven and thus deviating from a straight line. This deviation from a straight line is only exacerbated by additionally brushing in an attempt to remove more of the active material. Hence, the brushing does not effectively remove active material from a substrate including a binder and also does not produce a clear straight boundary between exposed substrate areas and areas which remain impregnated with active material.

The present invention differs from the Umiya reference in that it uses a substrate including a binder which holds active material impregnated into the substrate more securely. Additionally, the presently claimed invention replaces brushing with ultrasonic vibrations. It is respectfully submitted that using brushing on a substrate including a binder will not produce a exposed substrate having no active material as supposed by the Examiner. Further, since the Umiya reference does not include using a binder, the statement that portion 5 "contains no active substance" is not considered applicable to providing a teaching of the presently claimed invention wherein the active material includes a binder and a core substrate exposed section includes less than 4% remainder of active material. Hence, it is respectfully submitted that the product produced by the Umiya reference cannot anticipate the present claims for this feature alone. i.e., the Umiya teaching is non-

Docket No. F-8224

Ser. No. 10/823,919

enabling for producing an exposed substrate portion with 4% or less active material remaining.

Claim 3 further recites the following " said substantially true straight boundaries exhibit a deviation from straight of no more than 0.2 mm." In response to the disclosure of this feature, the Examiner states:

The reference teaches that the exposed portion is linear and compressed to a uniform thickness. Since the electrode is compressed to a desired thickness, there will be no deviation and substantially true straight boundaries.

On the face of it, applicant has difficulty understanding the above statement. Assuming *arguendo* that the exposed portion in the Umiya reference contains no active material and is compressed, it still does not follow that the boundary between the exposed portion and the portion including active material will be straight as set forth in claim 3. As discussed above, brushing is rather inaccurate and the effect of brushing on areas neighboring the exposed portion is to also remove active material from such area. The action of brushing and dislodges material from the neighboring active material containing portions into the exposed area. Given any brushing action, since bristles are moved across the material surface, right up until the point when brushing is stopped, the last stroke, for instance, can dislodge material into the exposed area and out of the active material containing area. At such points, the boundary deviates. Thus, contrary to the

Docket No. F-8224

Ser. No. 10/823,919

assumption in the Office Action, one skilled in the art of battery manufacture will recognize that given the Umiya teaching, it cannot be said that "there will be no deviation and substantially true straight boundaries."

That the Umiya brushing is inaccurate is especially apparent when one considers that when bristles of a brush encounter material, especially a porous material such as the sponged metal substrate, they are prone to be deflected by irregularities in the sponged material from side to side. It is the same porosity of the sponged material that is desirable for holding a large percentage of active material that also causes the bristles to deflect from straight. The action of the brush bristles is not so well maintained so as to produce the boundaries claimed in the present invention wherein the a deviation of no more than .2 mm is achieved. In fact, the Umiya disclosure fails to even quantify boundary straightness. Thus, it is respectfully submitted that the product of the Umiya reference does not include the boundary straightness feature presented in the presently pending claims.

Applicant has set forth two structural distinctions above which define the claimed product over the product of Umiya reference. The process limitations produce the structural distinctions in the *product* over the prior art *products*, and the distinctions must be given as much consideration as traditional product characteristics. Furthermore, "anticipation of invention set forth in product claims cannot be predicated on mere conjecture respecting the characteristics of products

Docket No. F-8224

Ser. No. 10/823,919

that might result from practice of processes disclosed in the references." *W.L. Gore Assoc., Inc. v. Garlock, Inc.*, 220 USPQ 303, 314 (Fed. Cir. 1983). Therefore, it would be improper to suppose that the teaching Umiya would produce the claimed 4% or less residual active material in a substrate wherein the active material included a binder as claimed. Still further, in order to anticipate, the prior art reference must be enabling, i.e., it must contain within its four corners a sufficient description to enable one to practice the invention of the rejected claim without undue experimentation or inventive skills. *Akzo N.V. v. U.S. Intern. Trade Com'n*, 1 USPQ2d 1241, 1245 (Fed. Cir. 1986). It is respectfully submitted that the process steps set forth in the pending claims produce a product which is structurally different from the prior art products, the difference being recited structurally in the pending claims, and that the prior art Umiya does not enable the production of the claimed product because it does not teach the method presented in the present product claims. Without the method presented in the claims, the claim product cannot result. First, the method of the Umiya reference does not enable the production of an exposed portion of the substrate with 4% or less residual active material wherein the active material includes a binder. Additionally, the process does not enable production of a substantially true straight boundaries that "exhibit a deviation from straight of no more than 0.2 mm."

Docket No. F-8224

Ser. No. 10/823,919

In view of the above, it is respectfully submitted that claims 3 and 5-12 particularly describe and distinctly claim elements not disclosed in the cited reference. Therefore, reconsideration of the anticipation rejections of claims 3 and 5-12 and their allowance are respectfully requested.

Claims 3 and 5-12 are rejected in the alternative as rendered obvious by the Umiya reference. The applicant herein respectfully traverses these rejections.

In setting forth the obviousness rejection, the Office Action states:

As the claims include a different method than the prior art, the claims are further rejected under 35 U.S.C. 103(a) (see MPEP 2112, form paragraph 7.27(d).) The prior art does not teach the same method of making the electrode as claimed, however the claims are to a product. MPEP 2113 states, "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process."

As discussed above with regard to the anticipation rejection, the product set forth in the pending claims is not the same product as that of Umiya reference. As the Office Action correctly notes, the process in the Umiya reference is different from that set forth in the claims. The above statement further states that the claims may be found obvious if the product is obvious over that of the prior art. It appears

Docket No. F-8224

Scr. No. 10/823.919

that the Office Action concedes that the product produced by the claims is different but asserts that the resultant product is obvious over the product of the Umiya reference. This is apparently set forth in the following statement:

The teachings of Umiya have been presented. The reference teaches that the electrode is compressed to a desired thickness equal in the coated and uncoated regions, but is silent to a deviation of such a substantially true straight boundary. It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare a true straight boundary because the electrodes are combined with an opposing electrode through an electrolyte filled separator to form a battery. A straight boundary will increase contact between adjacent electrodes and separator portions to allow for uniform contact between the electrolyte/separator and the electrodes to give improved capacity because no unused space will form between uniform electrodes. The artesian would have found the claimed invention to be obvious in light of the teachings of the references.

Applicant respectfully submits that the differences between the product of the pending claims and that of the Umiya reference are non-obvious for at least two reasons expanded upon below. The first is that a substantially true straight boundary with deviation of no more than .2mm is not taught nor hinted at the prior art. The second is that production of the present product is not enabled by the Umiya.

The Office Action admits that the Umiya reference is silent concerning the straightness of the boundary. However, despite this silence, the Office Action still

Docket No. F-8224

Ser. No. 10/823,919

avers that securing a true straight boundary would be desired and obvious "because the electrodes are combined with an opposing electrode through an electrolyte filled separator to form a battery." While such structure is known, the known art does not suggest that anything is to be gained by straightness of a boundary, especially one with less than .2mm deviation.

The Office Action elaborates further in suggesting that "[a] straight boundary will increase contact between adjacent electrodes and separator portions to allow for uniform contact between the electrolyte/separator and the electrodes to give improved capacity" However, the Umiya reference makes no such connection between capacity and boundary straightness. No prior art is cited for such a connection between boundary straightness and capacity. It appears that the only teaching of a desirability for boundary straightness is contained in the applicant's own disclosure. However, in determining obviousness, the basic issue is whether the applied references, alone or in any combination, suggest the claimed invention as a solution to the specific problem solved. It is the vantage point of attacking the problem at the time the invention was made that is to be examined.

In the present situation, the inventors seek to maximize capacity. The prior art of the Umiya reference is directed to improving capacity by using porous metal sponge impregnated with active substance, and forming good electrode contacts by removing active material. There is no recognition that boundary straightness

Docket No. F-8224

Scr. No. 10/823,919

should be maintained or improved in order to provide better capacity. It is simply an unrecognized variable and hence one which those of ordinary skill in the art would not directed to vary or improve upon. When prior art itself does not suggest or render obvious the claimed solution to that problem, the art involved does not satisfy the criteria of 35 U.S.C. §103 for precluding patentability. *Lindemann Maschinefabrik GmbH v. America Hoist and Derrick Co.*, 221 U.S.P.Q. 481 (Fed. Cir. 1984). It is respectfully submitted that the rejection set forth does not establish a prior art basis for the reason supposed by the Examiner to lead one to the claimed invention. Absent such basis, obvious cannot be establish.

It is further submitted, as a second ground for withdrawal of the rejection that the claimed invention cannot be rendered obvious because the prior art teaching does not even enable production of the claimed battery and electrode. It is settled case law that mere desirability of a characteristic of a product cannot render a product obvious when the prior art does not teach nor render obvious a process to enable production of a product with the characteristic. *In re Irani*, 166 USPQ2d, 27 (CCPA 1970). In the present case, the characteristics are those noted above with regard to the anticipation rejection, less than 4% residual active material in combination with active material held by a binder and further in combination with exposed section boundaries with straightness deviating no more than .2mm. Even if the prior art recognized that straighter boundaries had a

Docket No. F-8224

Ser. No. 10/823,919

potential benefit, and wanted to produce less than 4% residual active material in a binder impregnated substrate, the bottom line is that the prior art did not enable production of such a product. This is the reason for the patent issuing in the parent application. The holding in *In re Irani* dictates that in such situations, even a claim to a desired product is not to be ruled obvious because the product could not have been previously produced.

Lastly it is submitted that obviousness cannot be established because the rejection does not set forth where each element of the claim is found in the prior art. Those elements missing are set forth in the traverse of the anticipation rejection, namely less than 1.5% variation in impregnation density, less than 4% residual active material in an exposed substrate wherein a binder is used, and a boundary of less than .2 mm variation from straightness.

Thus, it is respectfully submitted that the rejected claims are not obvious in view of the cited reference for the reasons stated above. Reconsideration of the rejections of claims 3 and 5-12 and their allowance are respectfully requested.

NEW CLAIMS

New claims 21-26 are added and are directed to an impregnated battery electrode plate of the present invention. Each of these claims includes the features noted above with regard to the anticipation rejection that are absent in the applied

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Docket No. F-8224

Ser. No. 10/823,919

art. Namely, an active material impregnated porous substrate including a binder and which has a density variation of less than 1.5% in remaining impregnated areas, 4% or less residual active material by weight in the volume of the core substrate exposed section, and substantially true straight boundaries that exhibit a deviation from straight of no more than 0.2 mm. Hence, each of the added claims is submitted as patentable for including those features and notice to such effect is earnestly solicited.

REQUEST FOR EXTENSION OF TIME

Applicants respectfully request a one month extension of time for responding to the Office Action. Please charge the fee of \$120.00 for the extension of time to Deposit Account No. 10-1250.

If there is any discrepancy between the fee(s) due and the fee payment authorized in the Credit Card Payment Form PTO-2038 or the Form PTO-2038 is missing or fee payment via the Form PTO-2038 cannot be processed, the USPTO is hereby authorized to charge any fee(s) or fee(s) deficiency or credit any excess payment to Deposit Account No. 10-1250.

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p.25

Docket No. F-8224

Ser. No. 10/823,919

In light of the foregoing, the application is now believed to be in proper form
for allowance of all claims and notice to that effect is earnestly solicited.

Respectfully submitted,
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